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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/788,590
Filing Date: February 27, 2004
Appellant(s): VOORHEES ET AL.

Daniel N. Fishman (Reg. No. 35,512)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 5/25/2007 appealing from the Office action mailed 11/24/2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows: Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bakke et al. (U.S. Patent Application Publication No. 2005/0071532) in view of Badamo et al. (U.S. Patent Application Publication No. 2002/0181476), Seto (U.S. Patent Application Publication No. 2005/0138202), and Barrow et al. (U.S. Patent Application Publication No. 2002/0188786).

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

2005/0071532	Bakke et al.	3-2005
2002/0181476	Badamo et al.	12-2002
2005/0138202	Seto	6-2005
2002/0188786	Barrow et al.	12-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1-5, 12-14, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bakke et al. ("Bakke '532") (U.S. Patent Application Publication No. 2005/0071532) in view of Badamo et al. ("Badamo") (U.S. Patent Application Publication No. 2002/0181476) and Seto (U.S. Patent Application Publication No. 2005/0138202).

Regarding Claim 1, Bakke '532 discloses a multi-chip module (MCM) (Bakke '532, Figure 4, items 0, 1, 120) comprising:

A plurality of serial attached SCSI ("SAS") expander component circuits (Bakke '532, Figure 4, items 0,1,102, Page 2, paragraph 18, "edge expanders") each having a number of internal ports internal to the MCM (Bakke '532, Figure 4, item 120, Page 2, paragraph 20, "subtractive routing ports") and each having a number of external ports (Bakke '532, Figure 4, item 118, Page 2, paragraph 18, "direct routing ports") coupling to SAS devices external to the MCM (Bakke '532, Figure 4, items 104,106,108,110,112,114, Page 2, paragraph 17).

An internal fabric coupling together selected ones of the internal ports in selected ones of the plurality of component circuits (Bakke '532, Figure 4, see connection between Subractive Routing Ports 120); and

Coordination logic communicatively coupled to the plurality of SAS expander component circuits to coordinate operation of the plurality of SAS expander component circuits (Bakke '532, Page 2, paragraph 22, receipt of data from one of the devices causes the edge expanders to use logic to determine where the data is to be sent, therefore it would be obvious to one of ordinary skill in the art that there is coordination logic within the edge expanders).

Bakke '532 does not expressly disclose wherein the configuration of coupling together of the selected ones of the internal ports is static following initialization of the MCM, and

Wherein the coordination logic is adapted to present a unified expander to devices outside the module.

In the same field of endeavor (e.g. network infrastructure devices that allow communications through a protocol), Badamo teaches a configuration of coupling together of a selected ones of internal ports is static (ie. using a static, yet programmable, switch fabric) following initialization of a system (Badamo, Figure 3, item 20, Page 4, paragraphs 0041 and 0043).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined Badamo's teachings of network infrastructure devices that allow communications through a protocol with the teachings of Bakke '532 for the purpose of efficiently handling received packets in a network device (see Badamo, Page 1, paragraph 0005). Also, it would be obvious to one of ordinary skill in the art to have a simpler configuration that provides low cost customized component circuits.

Also in the same field of endeavor (e.g. managing multiple physical paths from a host computer system to peripheral devices), Seto teaches wherein coordination logic is adapted to present a single expander to devices outside a MCM (Seto, Figure 5a, item 180), wherein the single expander performs SCSI management protocol ("SMP") exchanges (Seto, Figure 2, item 38c, Page 2, paragraph 0014) as a single SAS address (Seto, Page 3, paragraph 0023).

Also, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined Seto's teachings of managing multiple physical paths from a host computer system to peripheral devices with the teachings of Bakke '532 for the purpose of providing efficient computing resources by the management of

multiple independent pathways to a computer system's peripheral devices. Bakke '532 provides motivation to combine with both Badamo and Seto by stating it is an object of the invention to implement resilient connectivity in a data processing network (see Bakke '532, Page 1, paragraph 11). Also, it would have been desirable as stated by Bakke '532 for the data network system to prevent loss of data through increased fault tolerance (see Bakke '532, Page 1, paragraphs 2-3).

Regarding Claim 2, Bakke '532 discloses wherein the plurality of SAS expander component circuits comprises a number of SAS expander components each having a number of internal ports (Bakke '532, Figure 4, item 120, Page 2, paragraph 20, "subtractive routing ports").

Regarding Claim 3, Bakke '532 discloses wherein the plurality of SAS expander component circuits comprises a number of SAS expander components each having a number of external ports (Bakke '532, Figure 4, item 118, Page 2, paragraph 18, "direct routing ports").

Regarding Claim 4, the examiner takes Official Notice that static fabric in the type of the system disclosed is a generally well-known type of internal fabric available in the prior art at the time of the applicant's claimed invention, therefore it would have been obvious to one of ordinary skill in the art to use static internal fabric.

Regarding Claim 5, the examiner takes Official Notice that a static fabric being configured at manufacture in the type of system disclosed is well-known in the prior art at the time of the applicant's claimed invention, therefore it would have been obvious to one of ordinary skill in the art to configure the static fabric at manufacture of the MCM.

Regarding Claim 12, the examiner takes Official Notice that the SAS expander component circuits of Bakke '532 would be adapted to utilize the SCSI Management Protocol ("SMP") message processing logic, as evidenced by "Serial Attached SCSI Link Layer – part 2", by Rob Elliot, HP Industry Standard Servers. Further, Seto teaches the use of SMP (Seto, Figure 2, item 38c, Page 2, paragraph 0014).

Regarding Claims 13 and 14, Seto teaches wherein the coordination logic is adapted to present a single SAS address and/or a single set of PHY numbers for the PHYs of the plurality of SAS expander component circuits (Seto, Figure 5a, item 180, Page 3, paragraph 0023).

The motivation that was used in the combination of Claim 1, super, applies equally as well to Claims 13 and 14.

Regarding Claim 17, Bakke '532 teaches a method for manufacturing a customized serial attached SCSI ("SAS") expander having a predetermined number of ports, the method comprising:

Disposing a number of SAS expander components (Bakke '532, Figure 4, items 0,1,102, Page 2, paragraph 18, "edge expanders") on a multi-chip module (MCM) (Bakke '532, Figure 4, item 100) wherein each SAS expander component has a number of internal ports internal to the MCM (Bakke '532, Figure 4, item 120, Page 2, paragraph 20, "subtractive routing ports") and each having a number of external ports (Bakke '532, Figure 4, item 118, Page 2, paragraph 18, "direct routing ports") coupling to SAS devices external to the MCM and wherein the number is sufficient to provide a total ports numbering substantially equal to the predetermined number of ports (Bakke '532, Figure 4, items 104,106,108,110,112,114, Page 2, paragraph 17);

Disposing an internal fabric on the MCM (Bakke '532, Figure 4, see connection between Subtractive Routing Ports 120);

Bakke '532 does not expressly teach configuring the internal fabric to provide desired routes between the total ports wherein following the step of configuring, the routes between the total ports remains static at least until the MCM is reset;

Disposing a control logic circuit on the MCM coupled to the internal fabric, wherein the step of configuring further comprises applying signals from a control logic circuit to the internal fabric to configure the internal fabric as a static fabric at reset of the MCM; and

Wherein the control logic circuit performs SCSI management protocol ("SMP") exchanges as a single address for the customized SAS expander.

In the same field of endeavor, Badamo teaches configuring internal fabric to provide desired routes between the total ports wherein following the step of configuring,

the routes between the total ports remains static at least until the MCM is reset (Badamo, Figure 3, item 20); and

Disposing a control logic circuit on the MCM coupled to the internal fabric, wherein the step of configuring further comprises applying signals from a control logic circuit to the internal fabric to configure the internal fabric as a static fabric at reset of the MCM (Badamo, Figure 3, item 36, Page 4, paragraphs 0038, 0041, 0043).

Also in the same field of endeavor, Seto teaches wherein a control logic circuit performs SCSI management protocol ("SMP") exchanges (Seto, Figure 2, item 38c, Page 2, paragraph 0014) as a single address for a customized SAS expander (Seto, Figure 5a, item 180, Page 3, paragraph 0023).

The motivations that were used in the combination of Claim 1, super, apply equally as well to Claim 17.

Regarding Claim 18, Bakke '532 teaches a method for manufacturing a customized serial attached SCSI ("SAS") expander having a predetermined number of ports, the method comprising:

Disposing a number of SAS expander components (Bakke '532, Figure 4, items 0,1,102, Page 2, paragraph 18, "edge expanders") on a multi-chip module (MCM) (Bakke '532, Figure 4, item 100) wherein each SAS expander component has a number of internal ports internal to the MCM (Bakke '532, Figure 4, item 120, Page 2, paragraph 20, "subtractive routing ports") and each having a number of external ports (Bakke '532, Figure 4, item 118, Page 2, paragraph 18, "direct routing ports") coupling to SAS

devices external to the MCM and wherein the number is sufficient to provide a total ports numbering substantially equal to the predetermined number of ports (Bakke '532, Figure 4, items 104,106,108,110,112,114, Page 2, paragraph 17);

Disposing an internal fabric on the MCM (Bakke '532, Figure 4, see connection between Subractive Routing Ports 120);

Disposing a coordination logic communicatively coupled to the plurality of SAS expander component circuits to coordinate operation of the plurality of SAS expander component circuits (Bakke '532, Page 2, paragraph 22, receipt of data from one of the devices causes the edge expanders to use logic to determine where the data is to be sent, therefore it would be obvious to one of ordinary skill in the art that there is coordination logic within the edge expanders).

Bakke '532 does not expressly teach configuring the routes between the total ports remains static at least until the MCM is reset, and

Wherein the coordination logic is adapted to present a single expander to devices outside the MCM.

In the same field of endeavor, Badamo teaches configuring an internal fabric to provide desired routes between the total ports wherein following the step of configuring, the routes between the total ports remains static at least until the module is reset (Badamo, Figure 3, item 20, Page 4, paragraphs 0041 and 0043).

Also in the same field of endeavor, Seto teaches wherein coordination logic is adapted to present a single expander to devices outside a module, wherein the coordination logic circuit performs SCSI management protocol ("SMP") exchanges

(Seto, Figure 2, item 38c, Page 2, paragraph 0014) as a single address for a customized SAS expander (Seto, Figure 5a, item 180, Page 3, paragraph 0023).

The motivations that were used in the combination of Claim 1, super, apply equally as well to Claim 18.

Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bakke '532 in view Badamo and Seto as applied to Claim 1 above (hereinafter "BBS"), in further view of Barrow et al. ("Barrow") (U.S. Patent Publication No. 2002/0188786).

BBS discloses the invention substantially as claimed.

BBS discloses the module of Claim 1.

Regarding Claim 6, BBS does not expressly disclose wherein an internal fabric is initially configured at reset of the MCM.

In the same field of endeavor (e.g. a data storage system which consists of communications between the system and external data exchanging devices), Barrow teaches an internal fabric (Barrow, Figure 5, item 302, Page 5, paragraph 38) that is initially configured at reset (Barrow, Page 5, paragraph 44) of an MCM (Barrow, Figure 3, item 26, Page 3, paragraph 25).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined Barrow's teachings of a data storage system which consists of communications between the system and external data exchanging devices with the teachings of BBS, for the purpose of decreasing latency in moving data from external devices to the data storage system and vice versa (see

Barrow, Page 1, paragraph 5). BBS provides motivation to combine by stating it is an object of the invention to implement resilient connectivity in a data processing network (see Bakke '532, Page 1, paragraph 11).

Regarding Claim 7, Barrow teaches a control logic circuit (Barrow, Figure 5, item 308, Page 5, paragraphs 38 and 43) to configure the internal fabric at reset of the MCM (Barrow, Page 5, paragraph 44).

The motivation that was used in the combination of Claim 6, super, applies equally as well to Claim 7.

Regarding Claim 8, Barrow discloses wherein the internal fabric (Barrow, Figure 5, item 302, Page 5, paragraph 38) comprises a programmable fabric (Barrow, Page 5, paragraph 42).

The motivation that was used in the combination of Claim 6, super, applies equally as well to Claim 8.

Regarding Claim 9, BBS discloses a SAS device (Bakke '532, Figure 4, items 104,106,108,110,112,114, Page 2, paragraph 17) coupled to an external port (Bakke '532, Figure 4, item 118, Page 2, paragraph 18, "direct routing ports") of a SAS expander of an MCM (Bakke '532, Figure 4, items 0,1,102, Page 2, paragraph 18, "edge expanders").

BBS does not expressly disclose wherein a programmable fabric is adapted to be configured by information from a SAS device coupled to an external port of a SAS expander of the MCM.

In the same field of endeavor, Barrow teaches wherein a programmable fabric (Barrow, Figure 5, item 302, Page 5, paragraph 38) is adapted to be configured by information received from an external device (Barrow, Page 5, paragraph 42, the switch fabric 302 may be configured by I/O interfaces or control interfaces).

The motivation that was utilized in the combination of Claim 6, super, applies equally as well to Claim 9.

(10) Response to Argument

Appellant's arguments filed 5/25/2007 have been fully considered but they are not persuasive.

With regards to Claim 1, Appellant argues that "[n]one of the references describe an MCM ["multi-chip module"] as the term is understood by those of ordinary skill in the art", and that the Examiner's interpretation is "clearly inconsistent with any reasonable understanding of the term of art by one of ordinary skill in the art." Appellant also provides extrinsic evidence in the Appeal Brief (i.e., using multiple dictionaries) regarding the definition of an MCM. While the definitions provided by Appellant do convey one interpretation of an MCM, the claim language along with the definition of an MCM provided in the original Specification presents a much broader definition of the term. This can be seen for example on Page 3, lines 14-19, where it is stated that a

MCM simply comprises "a plurality of SAS expander component circuits each having a number (n) of internal ports internal to the MCM and each having a number (m) of external ports for coupling to SAS devices external to the MCM; and an internal fabric coupling selected ones of the internal ports in selected ones of the plurality of SAS expander component circuits." As described in the Final Office Action, Bakke '532 teaches all of these limitations. Furthermore, Appellant's Specification expressly disclaims against any narrow interpretation of the terms used in the claims, see Page 12, lines 12-24 ("such illustration and description is to be considered as *exemplary and not restrictive in character*"; "those of ordinary skill in the art will readily recognize that features and aspects hereof *may be implemented equivalently in electronic circuits*..."; "the invention is not limited to the specific examples and illustrations discussed above, but only by the following claims *and their equivalents*."). Thus, it can clearly be seen that Appellant overly narrows the scope of the claim terminology in the arguments and that the Examiner's reading of the breadth of the claim language is fair and reasonable.

Further with regards to Appellant's use of extrinsic evidence as the primary source of rebuttal, the Examiner notes that the U.S. Court of Appeals for the Federal Circuit has held that a patent's claims must be construed by referring first to the patent and it's "prosecution history" and then, only in limited circumstances, to dictionaries and expert testimony. *Phillips v. AWH Corp.*, --F3d--, No. 03-1269, -1286, 2005 U.S. App. LEXIS 13954 (Fed. Cir. July 12, 2005). The court also held that the specification "is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." *Vitronics Corp. v.*

Conceptronic, Inc., 90 F.3d at 1582. Also, "[t]he descriptive part of the specification aids in ascertaining the scope and meaning of the claims inasmuch as the words of the claims must be based on the description. The specification is, thus, the primary basis for construing the claims." *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985).

Finally with regards to the claimed "MCM", even assuming Appellant's interpretation of an MCM is correct, although Bakke '532 does not expressly teach "[a]n integrated circuit package that contains two or more interconnected chips" (as required by Appellant's dictionary definition) it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the expander circuits 0, 1, 102 into one package, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893). Furthermore, Seto clearly teaches an MCM as device 180 in Figure 5a, see also Page 3, paragraph 0023. In response to Appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Therefore, Appellant's arguments regarding this limitation are not persuasive.

Also with regards to Claim 1, Appellant argues that "[t]hough the word 'static' is used by Badamo, it is clear to one of ordinary skill in the art that the 'routing' performed by FC 20 of Badamo is 'dynamic' or 'flexible'". The Examiner respectfully disagrees.

Contrary to Appellant's argument, the manner in which the internal fabric (i.e., switch fabric card [FC] 20) of Badamo operates after initialization is the same as how the internal fabric of the present invention operates after initialization. Firstly, the portion of Appellant's Specification which supports the claimed "static" internal fabric can be found on Page 7 line 29 – Page 8 line 10, where it is stated that "[a]lterations in the program logic of control and coordination element 304 *may provide a different static configuration* set of the MCM expander 300." Therefore, it can be seen that the internal fabric is programmable, but becomes static upon initialization of the MCM expander (e.g., at reset of the MCM expander). Similarly, page 4, paragraph 0041 of Badamo states that "[a]ny line card 22 can send traffic to any service card 24", and further "[t]his routing *can be configured statically* or can be determined dynamically by the line card 22." Paragraph 0043 also states that "[i]n the latter case (referring to a non-intelligent line card 22), the assignment of LCs 22 to SCs 24 *is static, but programmable*." In other words, while FC 20 is programmable and may provide dynamic and flexible routing, it may also selectively provide static routing. Therefore, it can be seen that the internal fabric (FC 20) of Badamo operates in the same manner as the internal fabric of the instant claims.

Therefore, Appellant's arguments regarding this limitation are not persuasive.

Finally with regards to Claim 1, Appellant argues that "the cited portions of Seto do not show a device that has multiple SAS expanders (or other SAS devices) that respond as a single SAS device with a single SAS address in SMP exchanges", and further "the Examiner fails to understand that the claimed MCM comprises multiple SAS

expander components." The Examiner respectfully disagrees. First, the Bakke '532 reference was used in the rejection to teach the claim limitation of multiple SAS expanders within a MCM. Again, it appears Appellant is attempting to improperly attack the references individually when the rejection was based on a combination of references. Second, Contrary to Appellant's argument, the combination of Bakke '532 and Seto does in fact teach wherein a device comprises of multiple SAS expanders that respond as a single SAS device with a single SAS address in SMP exchanges. As admitted by Appellant, all SAS devices communicate using SMP exchanges, see Page 13, lines 16-18 of the Appeal Brief. Further, contrary to Appellant's argument, Appellant's own Specification supports the Examiner's characterization that the multiple PHYs shown in Figure 5a of Seto being addressed by only one address ("SAS Address X") is equivalent to the claimed limitation of "wherein the single expander performs SMP exchanges as a single address". Page 8, lines 19-30 of the instant Specification (the portion of the disclosure for which this limitation is supported) states that "the coordination (referring to operations by control and configuration element 304) may include presenting a single SAS address for the entire MCM expander 300, *presenting a single set of PHY numbers for the multiple PHYs provided by the MCM expander 300*, and processing all SMP functionality through the single set of PHYs as if the PHYs and SMP processing are within a single expander device." As can be seen in Figure 5a and Page 3, paragraph 0023 of Seto, this is the same manner in which a single address for multiple PHYs is displayed to external SAS devices ("where the *PHYs in the device 180 are configured to have one SAS address* 'x'").

Therefore, Appellant's arguments regarding this limitation are not persuasive.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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